DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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September 29, 1994

Mr. Mark Whitaker, EH-6
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are eight (8) Defense Nuclear Facilities Safety Board (DNFSB) staff reports. The reports have been placed in the DNFSB Public Reading Room.

Sincerely,

George W. Cunningham
Technical Director

Enclosures (8)

94-0005336

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: J. W. Troan

SUBJECT: Report on the Radiation Protection Program at the Idaho National Engineering Laboratory

1. **Purpose:** This memorandum documents the Defense Nuclear Facilities Safety Board (DNFSB) technical staff and outside expert assessment of the Radiation Protection Program at the Idaho National Engineering Laboratory (INEL). The review was based on a visit to INEL on March 7-11, 1994.

2. **Summary:** The Radiation Protection Program at INEL was reviewed at the site and facility level for two specific facilities: the New Waste Calcining Facility (NWCF) at the Idaho Chemical Processing Plant (ICPP) and the Radioactive Waste Management Complex (RWMC). Based on the site and document reviews, the program was considered satisfactory. However, some weaknesses were identified that indicate the adherence to requirements are in need of improvement. Highlights of the program's strengths and weaknesses include:

   - The organization is structured appropriately to support implementation of an effective Radiation Protection Program.

   - Full implementation of the Radiological Control Manual is planned for 1996, and not this fall as had been stated by DOE Idaho and Westinghouse Idaho Nuclear Company (WINCO) personnel at the July 1993 Public Meeting.

   - The Order assessment process sometimes lacked rigor and effective management.

   - Field implementation of radiological work practices do not consistently support maintaining radiation exposure As Low As Reasonably Achievable (ALARA).

   - The level of knowledge acquired through General Employee Radiological and Radiological Worker Training appeared satisfactory for basic understanding. The current training of Radiological Control Technicians and their Supervisors was not as effective. Moreover, implementation in the field does not always reflect good radiological work practices commensurate with the training.

- The ICPP NWCF Facility Representative training and qualification process is in progress. This training and qualification process may be impacting available resources for oversight of the activities at the NWCF, and it was not apparent that appropriate consideration was given to this situation.

3. **Background:** DOE Order 5480.11, *Radiation Protection for Occupational Workers,* DOE Notice 5480.6, *Radiological Control (Radiological Control Manual),* and DOE Order 5400.5, *Radiation Protection of the Public and the Environment,* establish the requirements for radiation protection for workers, the public and the environment. These standards were used in the assessments of the program, and of employee work practices, training and knowledge level. The review included a spot check of compliance with DOE Orders, including the Radiological Control Manual (Manual), and other applicable standards. Compliance was assessed from two perspectives. First, compliance was reviewed from the administrative or procedural standpoint. Second, an adherence based assessment of compliance was made that consisted of tours of work areas and discussions with operators. The review was conducted by: Lester Clemons, Jim Troan, DNFSB Staff, Ned Dietrich and Ted Quale, Outside Experts.

4. **Discussion/Observations:**

a. Organization: The organization at the INEL is structured in a manner that supports the implementation of an effective Radiation Protection Program. It was encouraging to note a commitment to consistency among the contractors and DOE-Idaho (DOE-ID). Management appeared to be committed to developing ideas that will improve the radiological control program, and has established committees that help to facilitate program uniformity across the site.

b. Radiological Control Manual Implementation: INEL contractors are progressing toward implementing the requirements of the Manual. However, full compliance is not planned to be achieved until 1996. Overall, the INEL's plan to accomplish Manual training is consistent with the DOE Implementation Plan for DNFSB Recommendation 91-6. Progress and status of implementation is given in Figure (1) and Attachment (1).

Although the Manual implementation schedule is in agreement with the Recommendation 91-6 Implementation commitment, it is inconsistent with that presented by DOE and WINCO at the July 13, 1993, Public Meeting on Health and Safety Issues at the INEL. Specifically, a Deputy Manager from DOE-ID indicated that implementation plans were issued and tracked, and that all actions were to be

completed before November 1994[1]; and the WINCO President stated that the date of full implementation of the Radiological Control Manual will be November 1994[2].

Funding for implementation of the Manual was described by DOE-ID as transparent to DOE-HQ. In the case of WINCO, it appeared that implementation was being accomplished within the existing budget and no further funding requirement requests were expected. However, during a briefing, EG&G identified a need for some additional funding, and stated that information regarding these requests would be forthcoming. These additional requirements appeared to be unexpected by DOE-ID personnel.

The following highlights the review of the Manual's implementation: 1) Contractor specific Manuals were reviewed, and it was noted that contractors that relied on other contractors for radiological control services had or were developing Memoranda of Understanding; 2) In some of the Manual Implementation Plans, the technical justification for "compensatory measures" and "not applicable" items were not always provided; 3) The Protection Technology Incorporated (PTI) Manual did not include Article 514, *Area Monitoring Dosimeters*, and Article 515, *Nuclear Accident Dosimetry;* and 4) The results of DOE-ID's Manual compliance assessment were not presented. It was stated that DOE-ID is not under Defense Programs (DP), and it was not considered that this would be of interest to the DNFSB staff.

c. DOE Order Compliance: Compliance with the DOE Manual and related DOE Orders appears to be acceptable but some weaknesses were identified. For example: 1) DOE oversight of the Management and Operations (M&O) contractors' order compliance process appears to be weak in that DOE-ID personnel were unable to discuss the contractors' status of assessing compliance with DOE Order 5400.5. The methodology presented did not utilize the current order compliance philosophy, and the DOE-ID personnel were not able to discuss whether a compliance assessment had been performed by the various M&O Contractors on this order; 2) DNFSB Staff review of WINCO's Implementation Plan for DOE Order 5400.5 identified that WINCO considered the Order's Chapter IV, *Residual Radioactive Material*, as "Not Applicable." The justification for this position was that WINCO does not lease land or buildings back to the public. However, the scope of this chapter goes beyond this concern; and 3) One contractor assessed compliance with the DOE Manual on an article-by-article basis rather than on a requirement-by-requirement basis.

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[1] Testimony from DNFSB Public Meeting on July 13, 1993, concerning Health and Safety Issues at the Idaho National Engineering Laboratory, page 118, line 3.

[2] Testimony from DNFSB Public Meeting on July 13, 1993, concerning Health and Safety Issues at the Idaho National Engineering Laboratory, page 44, line 14.

d. ALARA Program: It appears that mechanisms are in place to facilitate communication and coordination of the ALARA program among facilities within each contractor, and among the various contractor and government organizations at the INEL. Highlights of the review include: 1) DOE-ID has an ALARA program only for personnel assigned to the Radiological and Environmental Services Laboratory (RESL) project. This is reportedly based on the premise that these are the only personnel who do radiological work. However, since DOE-ID personnel routinely enter other radiological areas on the site, it is not clear why this program does not include other DOE-ID personnel (i.e., Facility Representatives); and 2) an ALARA review was discussed, and it appeared that the process was effective in identifying a problem associated with dose estimation. However, the process did not recognize nor take corrective actions relative to the cause of the problem (inadequate engineering to reduce exposure). In fact, when questioned on this point, the responsible Radiological Control Manager initially stated that, as long as such problems were corrected at any point by the ALARA process, there were no deficiencies to be corrected. After additional discussions, the Radiological Control Manager concluded that additional investigation was warranted.

e. Radiological Control Training: Training was discussed, and DOE-ID personnel reported that DNFSB Recommendation 91-6, Radiological Training for General Employees and Radiological Workers, has been completed; and Radiological Control Technician training to meet the Manual's training requirements is expected to be complete by December 1994. Highlights include: 1) The Visitor Orientation video tape appeared to be outdated. For example, several actions recommended by the tape could result in a significant increase in personnel exposure, if followed during an evacuation due to an inadvertent criticality; 2) Overall, those interviewed in the Radiological Worker I and II, and the General Employee categories appeared to be better trained to the requirements than did those qualified as Radiological Control Technician and Supervisor. The Radiological Worker and General Employee personnel appeared to have a good practical understanding of radiological principles and controls, while some Radiological Control Technicians did not have an appreciation for applying theory to practice; and 3) In a recent incident, workers exceeded the weekly administrative radiation exposure control level. Although, the workers had just completed Radiological Worker (RW) II retraining as recently as October 1993, they did not adequately employ basic good radiological work practices. The cause of these deficiencies is not clear (e.g., training program, retention, work culture).

f. Work Procedures: Select procedures were reviewed by the Staff and, in general, the procedures provide adequate guidance. A Westinghouse Government-Contractor (GOCO) effort has resulted in Radiological Control Work Practice manuals that should be of benefit to the INEL and other sites. Highlights include: 1) The staff noted an inconsistency among contractors in the requirements for respiratory protection, as well as some errors in procedures. For example, an error was noted in

EG&G Procedure 10.3, *Airborne Radioactivity Monitoring*, dated 1-28-94, and Document Revision Request (DRR) dated February 14, 1994. These documents gave equations for computing High Alarm Setpoint that are not correct; and 2) Other procedural discrepancies were noted, and ranged from inconsistencies with the Manual to limited details for implementing the program. For example, EG&G Procedure 10.5, *Personnel Dosimetry and Response to an Accidental Criticality*, did not give detailed guidance for managing the application of Field Correction Factors, and set the threshold level for requiring a neutron dosimeter above that specified in the Manual.

g. New Waste Calcining Facility: A review and tour of the New Waste Calcining Facility (NWCF) were conducted. Highlights include: 1) Maintenance of radiological controls was deficient in some areas. For example: a posted fixed contamination area in a stairwell had paint chipping from the walls; bags of radioactive waste were not appropriately marked; yellow herculite on walls adjacent to a contamination area was not draped and was falling into the area; and a headset for two-way communications was lying in the contamination area; 2) The Manual's requirements for posting and use of personal protection equipment were not met at a valve operating station; 3) air flow reversal between rooms in the NWCF may occur when there is a total loss of electric power. Emergency electrical power supplies are available to prevent this event. However, emergency power failed to come on-line during a recent power outage; 4) air monitoring for alpha radioactivity in the building is accomplished by one continuous air monitor. The technical basis for its placement was not discussed and will have to be examined by the Staff; and 5) conversations at the NWCF revealed that Facility Representative training and qualification has been given a high priority, and, therefore, a significant amount of the representative's time is dedicated to the effort. It is the Staff's understanding that this training and qualification process may be impacting available resources for oversight of the activities at the NWCF, and it was not apparent that appropriate consideration was given to this situation.

h. Radioactive Waste Management Complex: A review and tour of the Radioactive Waste Management Complex (RWMC) were conducted. Highlights include: 1) The existing method of stacking drums of waste in the air supported buildings in the RWMC does not allow for inspection of the drums for leakage or other deterioration, and is not in keeping with good practice; 2) Radiation surveys performed in the high level waste pit area, an area controlled as a high radiation area, were not documented as required by the Manual; 3) The postings in radiation areas to alert personnel to the presence of radiation and radioactive materials in order to aid in minimizing exposures did not always appear effective; and 4) Although several individuals are involved in operations in the high level waste pit area where dose rates can reach several rem per hour, standard actions are not taken to control personnel exposure and preclude unnecessary exposure.

5. **Future Staff Actions:** Staff actions are expected to include the following:

a. At the EG&G RWMC: 1) Evaluate workplace conditions and compliance for posting radiation signs in appropriate locations. Specifically, monitor for the use of radiation sign postings where there is the potential for workers to receive non-productive exposures; and 2) Evaluate the application of neutron dosimeter field correction factors.

b. At the WINCO NWCF: 1) Observe an emergency drill, such as a radioactive liquid spill drill complicated by an injured person; 2) Evaluate the technical basis for air monitoring; and 3) Evaluate the results of corrective action taken to increase the reliability of the emergency power supply.

c. At the various contractor levels: 1) Verify that Memoranda of Understanding (MOU) between parties are established for Manual requirements as generally identified by the Manual Implementation Plans; 2) Review select Manual compliance assessments that report partial compliance; 3) Monitor progress of incorporating "lessons learned" from the occurrence where personnel exceeded administrative control level into tank farm conduct of operations; and 4) Review implementation and assess effectiveness of Radiological Control Training.

ATTACHMENT (A)

RADIATION PROTECTION REVIEW
AT THE
IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
CONDUCTED ON
MARCH 7-11, 1994

DNFSB STAFF DISCUSSION AND OBSERVATIONS

1. **Discussion/Observations:**

a. Organization - The Radiation Protection Program's organization at the Idaho National Engineering Laboratory (INEL) is structured in a manner that supports the implementation of an effective Radiation Protection Program. It was encouraging to note a commitment to consistency among the contractors and DOE-ID. Management appeared to be committed to developing ideas that will improve the radiological control program, and has established committees that help to facilitate program uniformity across the site. Various Radiological Working Groups exist, as well as an INEL Training Advisory Council (ITAC). A specific example is the adoption of a common Radiation Work Permit (RWP) at INEL. This type of site coordination should contribute to easing the transition to a single prime contractor which is planned for the Fall 1994.

b. Radiological Control Manual Implementation - The Staff reviewed the Radiological Control Manual (RCM) Implementation Plans for the INEL, and has identified that full implementation will not be achieved until 1996 (refer to Attachment (1)). In general, this schedule is in agreement with the Recommendation 91-6 Implementation commitment. However, the schedule is inconsistent with that presented by DOE and WINCO at the July 13, 1993 Public Meeting on Health and Safety Issues at the INEL. Specifically, a Deputy Manager from DOE-ID indicated that implementation plans were issued and tracked, and that all actions were to be completed before November 1994[1]; and the WINCO President stated that the date of full implementation of the Radiological Control Manual will be November 1994[2].

Funding for implementation of the RCM was described by DOE-ID as transparent to DOE-HQ. In the case of WINCO it appeared that implementation was being accomplished within the existing budget, and no further requirement requests were expected. However, during a briefing, EG&G identified that some additional funding was required, and information regarding these was forthcoming. These additional requirements appeared to be unexpected by DOE-ID personnel.

c. Compliance Assessment - The status of compliance for implementation of DOE Order 5480.11, DOE Order 5400.5, and the DOE RCM. and the process of assessment was examined by the DNFSB Staff. In general, the DOE RCM implementation program for

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[1] Testimony from DNFSB Public Meeting on July 13, 1993, concerning Health and Safety Issues at the Idaho National Engineering Laboratory, page 118, line 3.

[2] Testimony from DNFSB Public Meeting on July 13, 1993, concerning Health and Safety Issues at the Idaho National Engineering Laboratory, page 44, line 14.

WINCO, EG&G, MK-Ferguson, and Protection Technologies Inc, (PTI) appeared to be in the process of being administratively implemented. Some weaknesses were identified with the compliance assessment process associated with some DOE Orders. The following highlights the strengths and weaknesses:

- DOE oversight of the M&O contractors process appears to be weak in that DOE-ID personnel were unable to discuss the contractors status of assessing compliance with DOE Order 5400.5. The methodology presented did not utilize the current order compliance philosophy. Furthermore, the DOE-ID personnel were not able to discuss whether a compliance assessment had been performed by the various M&O Contractors on this order.

- DNFSB Staff review of WINCO's Implementation Plan for DOE Order 5400.5 identified that WINCO considered the Order's Chapter IV, *Residual Radioactive Material*, as "Not Applicable." The justification for this position was that WINCO does not lease land or buildings back to the public. However, the scope of this chapter goes beyond this fact.

- DNFSB Staff review of WINCO's Implementation Plan for DOE Order 5400.5 identified that Chapter II, paragraph .5.c.(6), *Release of Property having Residual Radioactive Material, Volume Contamination*, was not addressed. Although, the requirement states that no guidance is currently available for release of material that has been contaminated in depth, the paragraph does state that such material may be released if criteria and survey techniques are approved by EH-1. The applicability and procedures used in this case are not evident.

- DNFSB Staff review of WINCO's Implementation Plan for DOE Order 5400.5 identified that Chapter II, paragraph 2, *The ALARA Process*, is given the status of "Inadequate." WINCO notes that there is an ALARA Program for workers but the program does not address radiation protection for the public and the environment. Details concerning the implementation of this requirement is not provided. However reference is made to "WAR 91075-002,", which may contain information.

- WINCO's RCM Implementation Plan appeared well constructed, and typically provided reference to the source that satisfied "administrative compliance."

- It was reported that in some cases, compliance with the DOE RCM was assessed on an article-by-article basis rather than on a requirement-by-requirement basis. For example, the compliance assessment performed by EG&G for the DOE RCM was done on an article-by-article basis rather than on a requirement-by-requirement basis. This is contrary to the expectations of existing order

compliance review methodologies.

- The technical justification for compensatory measures were not always provided. It appears that some of WINCO's compliance assessments which report partial compliance should have a more fully explained technical basis for the reported compensatory measure. (i.e., see Article 543 Exposures to Airborne Radioactivity as an example).

- The results of DOE-ID's RCM compliance assessment was not presented. It was stated that DOE-ID is not under DP and it was not considered that this would be of interest to the DNFSB staff.

- In the discussion related to compliance verification, it appeared that the focus had been concentrated on administrative verification rather than on field verification (i.e., paper versus people).

- Some contractors rely on other contractors programs, and expectations are defined in a Memorandum of Understanding (MOU) between the parties. The Staff noted that in some cases, these agreements were not yet formally established. For example, PTI's RCM Implementation Plan identifies that draft interface agreements with some INEL radiological facility contractors are in various stages of review with a target date of March 31, 1994. PTI uses the following statement in their compliance assessment; "PTI is in compliance with this section to the extent that the radiological facilities in which PTI personnel work are in compliance for ...."

- A spot check of PTI's RCM revealed that it did not include Article 514, *Area Monitoring Dosimeters*, and Article 515, *Nuclear Accident Dosimetry.*

- Articles noted as Non-Applicable were not always justified. For example, in the MK Ferguson RCM Implementation Plan, no justification is provided for Articles 153, 154, 155, 533, 541, 542.

- The MK Ferguson RCM Implementation Plan does not indicate where compliance is achieved by reliance on other's programs.

- General Employee Radiological Training (GERT) is not required by EG&G if a person is trained as a Radiological Worker. The RCM, Article 621 recommends GERT for all employees.

d. ALARA - The ALARA Program at the INEL was discussed, and the following highlights are provided:

- It appears that mechanisms were in place that facilitates communication and coordination of the ALARA Program between facilities within a contractor, and the various contractor and government organization at the INEL.

- DOE-ID only has an ALARA program for personnel assigned to the Radiological and Environmental Services Laboratory (RESL) project. This is reportedly based on the premise that these are the only personnel who do radiological work. Since DOE-ID personnel routinely enter other radiological areas on the site it may be appropriate to expand this program to include other DOE-ID personnel such as facility representatives.

- The EG&G Radiological Control Manager cited as an example of the success of his ALARA program an instance where the Site (EG&G) ALARA Committee had discovered inadequate engineering to reduce exposure for work to be done at the Advanced Test Reactor (ATR) during a maintenance outage. The ALARA Committees actions reportedly resulted in reduction of the dose estimate from 74.3 to 14 person-rem. While it is commendable that this significant dose savings was identified by EG&G personnel, the Radiological Control Manager had not recognized nor taken corrective actions relative to why the reduction in dose had not been engineered at an earlier point in the process. In fact, when questioned on this point, the Radiological Control Manager initially stated that as long as such problems were corrected at any point by the ALARA process there were no deficiencies to be corrected. After additional discussions the Radiological Control Manager concluded that additional investigation was warranted.

e. Training - Training was discussed, and DOE-ID personnel reported that DNFSB Recommendation 91-6, Radiological Training for General Employees and Radiological Workers, has been completed; and Radiological Control Technician training to meet the Manual's training requirements is expected to be complete by December 1994. The following items are highlighted from the review:

- General Employee Radiological Training (GERT) - GERT is not required by EG&G if a person is trained as a Radiological Worker. The RCM, Article 621 recommends GERT for all employees.

- Radiological Worker Training - In December 1993, an incident occurred at the Idaho Chemical Processing Plant (ICPP) Tank Farm Upgrade Project where two workers, while working in a valve junction box received radiation exposures that exceeded the weekly administrative control level of 300 mrem. Although, the workers had just completed Radiological Worker (RW) II retraining as recent as October, 1993, they did not adequately employ the basic good radiological work

practices, and it is not clear where these deficiencies originate (i.e., training program, retention, work culture).

- Radiological Control Technician (RCT) Training - From the discussions with personnel in the field, it appears that the WINCO RCT Training program that is being implemented may be less than effective. The effectiveness of this program should be evident in the comprehensive exam and at the oral boards. The training program was discussed during interviews with WINCO personnel, and the following highlights are provided:

  - Training is done on overtime, and sometimes requires completing three core modules and exams on one shift,

  - Core training is not an organized program, students are provided with core manuals for self-study and then attended core classes; and

  - One interviewee was concerned about the outcome of the final exam, since all modules are covered and training has been in spurts over an extended period of time.

  - One interviewee had difficulty relating textbook concepts to in-plant daily activities. (i.e., Curies, DAC, CPM, Conduct of Operations, etc.).

- Visitor Training - The visitor orientation video tape that was shown to the review team appeared to be outdated. The DOE-ID Radiological Controls Manager stated that the tape was the most current available. Specific problems noted included several actions recommended by the tape that could result in a significant increase in personnel exposure if followed during an evacuation due to an inadvertent criticality.

  - The tape stated that during an evacuation (no differentiation was provided concerning type of evacuation) personnel should remove booties prior to leaving the contaminated area if time permitted.

  - Personnel were instructed to stop and "key card out" in the event of an evacuation.

  - Personnel were instructed to shutdown their work areas prior to evacuating.

  - Personnel were instructed to contact Health Physics personnel prior to contacting medical in the event of an open wound. If this action would delay response by medical personnel to a serious injury, it is inappropriate.

f. Procedures/Work - Select procedures were reviewed by the Staff, and in general, the procedures provide adequate guidance. The following highlights strengths and weaknesses:

- Through a Westinghouse Government-Contractor (GOCO) effort, a "Radiological Work Practices Information Manual" has been developed. WINCO presented a "Westinghouse Radiological Containment Guide", WHC-EP-0749, that was published March 1994. Both of these documents should contribute to improving radiological work practices, and has the potential to reach beyond INEL since they provide uniform guidance for other Westinghouse contractors (i.e., Idaho National Engineering Laboratory, Westinghouse Hanford Company, Westinghouse Savannah River Company, and West Valley Nuclear Services).

- EG&G Procedure 10.1, *Obtaining Health and Safety Permit Cards/TLD Badges*, dated 8/24/90 defines "Radiological Area", and describes when a TLD is required to be worn, in a manner that is not consistent with the RCM.

- EG&G Procedure 10.3, *Airborne Radioactivity Monitoring*, dated 1/28/94, establishes the requirement to wear respiratory protection at 0.5 DAC or 4 DAC-Hrs over a 8 hour period. This requirement is noted because it differs from the practices of WINCO, and the requirement to wear respiratory protection at 0.1 DAC, which is typically found in the complex.

- EG&G Procedure 10.3, *Airborne Radioactivity Monitoring*, dated 1-28-94, and Document Revision Request (DRR) dated February 14, 1994 gives equations for computing High Alarm Setpoint that are not correct. Specifically, the revised equation for Appendix B does not: 1) convert DPM to CPM (Continuous Air Monitor efficiency), 2) show DAC conversion, and 3) does not use the typical DPM to micro-curie conversion significant figures.

- EG&G Procedure 10.5, *Personnel Neutron Dosimetry and Response to an Accidental Criticality*, Section 2.1.2, states that neutron dosimetry is required when personnel will be, or potentially may be exposed to levels of neutron radiation above 15 mrem/month. This is not consistent with the RCM, Article 511 requirement, which requires neutron dosimetry when a person is likely to exceed 100 mrem annual from neutrons (e.g. 8.33 mrem/month).

- EG&G Procedure 10.5, *Personnel Neutron Dosimetry and Response to an Accidental Criticality*, Section 2.1.1 describes the planned neutron assessment, but does not give detailed guidance on survey methods, and does not give procedures for managing the use of the dosimeter and its corresponding Field Correction Factors.

- WINCO was questioned about procedure writing, and it did not appear that the briefing participants were acquainted with DOE-STD-1029-92 of December 1992: "DOE Standard - Writers Guide for Technical Procedures."

g. New Waste Calcining Facility (NWCF) - The DNFSB Staff and Outside Expert accompanied the WINCO Waste-Side and Health Physics Supervisors, and a DOE-ID Facility Representative on a tour of the NWCF. The NWCF was shutdown for maintenance. The following observations highlight the tour:

- Facility housekeeping was fair; there were dirty ventilation screens, some floor seam tapes were loose, and a radiological area (e.g., Contamination Area) was not well kept. For example, bags of radioactive waste were not appropriately marked; yellow herculite on walls was not draped, and was falling into the area; and a headset for two-way communications was laying in the Contamination Area.

- Caution Signs posted at a valve operating station identified the requirement for the use of gloves for operating or handling equipment, the need to contact Operations Health Physics (OHP) for all other work, and the requirement for personnel survey after work. These signs were unusual since they appeared to be posted in order to establish requirements to prevent radioactive contamination, however, the system was not marked as a radioactive system, nor was the type of glove to be used specified. Discussion with facility personnel indicated that work gloves may be used. Given work on potentially radioactively contaminated system, these work practices are not in keeping with the RCM requirement, Article 461, *Personal Protective Equipment and Clothing*, which requires that protective clothing designated for radiological control use shall be specifically identified by color, symbol or appropriate labeling, and not be used for non-radiological work. During the tour, WINCO personnel touched the piping without the use of gloves. This violation was identified by another WINCO employee, and a personal survey for contamination was directed.

- Air flow reversal between rooms in the NWCF may occur when there is a total loss of electric power. Emergency electrical power supplies are available to prevent this event. However, emergency power failed to come on-line during a recent power outage. The cause and resolution of this problem was noted to be under investigation by WINCO.

- The NWCF has only one Alpha Continuous Air Monitor (CAM), and it is being evaluated for removal. An evaluation of the need for the Alpha CAM, the technical basis for the present population and placement, and justification for its removal was not examined as part of this review. During the course of the review, WINCO personnel stated that they had not been asked to comment on the DOE

Augmented Evaluation Team (AET) Report on Alpha CAM. The Staff notes that this report's findings and recommendations may be applicable to WINCO.

- Remote indicators for Radiation Area Monitors (RAM) that were located in the NWCF Control Room were identified to locations in the NWCF that did not use the exact nomenclature used for actual area in the facility. NWCF personnel stated that this deficiency was being corrected. A RAM located in a vestibule to the Crane Maintenance Area (CMA) within the Radiological Buffer Area was noted by the Staff to read approximate 2 mrem/hour, while an adjacent RAM in the CMA indicated a radiation level of approximately 0.1 mrem/hour. The difference was questioned since the CMA is closer to the radiation sources. An explanation was not obtained at the time of the review. The NWCF personnel noted that RAM's had not been designed with the ability to remotely calibrate, and as such RAM's in radiation areas may elapse on periodic calibration because of the need to get the calibrator into the Radiation or High Radiation Area.

- A make-shift gutter system was installed on a wall in the CMA for the purpose of collecting a water leak. The leak was apparently from the roof, and followed a path along the wall, around a ventilation duct and down to the floor where it was collected. The NWCF personnel indicated that management was aware of the problem.

- A Fixed Contamination Area was posted in a stair-well leading from the CMA. The staff noted that paint was chipping from the walls, exposing bare cinderblock surfaces. Maintenance of this area was not in keeping with the RCM, Article 222, *Contamination Control Levels*.

The Staff had some discussions with the DOE Facility Representatives for the ICPP. It appeared that the Facility Representatives were monitoring various projects at the ICPP, and were involved in a Facility Representative Training and Qualification Program. Conversations with the NWCF personnel revealed that Facility Representative training and qualification has been given a high priority, and as such, a significant amount of his time is dedicated to the effort. It is the Staff's understanding that this training and qualification process may be impacting available resources for oversight of the activities at the NWCF, and it was not apparent that appropriate consideration was given to this situation.

h. Radioactive Waste Management Complex (RWMC) - A review and tour of the Radioactive Waste Management Complex (RWMC) was conducted and the following observation highlights are provided:

- The existing method of stacking drums of waste in the Air supported buildings in the RWMC does not allow for inspection of the drums for leakage or other deterioration. The drums are stacked four or five high and several rows deep. This orientation is even used for drums that have been identified as having deterioration so severe (due to prior underground storage) that they have been designated for overpack/repack.

- The process for placing waste in the high level waste pit was reviewed. This area is permanently controlled as a high radiation area. Several deficiencies were identified during the review & tour of this area, and the following highlights are provided:

    - Radiation surveys performed in the area are not documented as required by the DOE RCM, Article 551, *Radiological Monitoring and Survey Requirements*. This precludes, among other things, compliance with the article 551.11 "should" requirement that monitoring results be made available to line management and used in support if pre- and post-job evaluations, ALARA preplanning, contamination control and management of radiological conditions.

    - Several personnel are involved in operations in this area where dose rates can reach several rem per hour. However, standard actions are not taken to control personnel exposure and preclude unnecessary exposure. While it is recognized that historically personnel exposures have been low in this area, the following techniques can serve to preclude inadvertent exposure to high radiation levels. These techniques include:

        - Placing restrictions on personnel movement to preclude unnecessary access to areas with elevated dose rates.

        - Briefing personnel on the locations of areas of high and low radiation dose rates in their assigned work areas using radiation survey maps.

        - Establishing barriers to preclude unnecessary access to areas of high radiation dose rates during movement of highly radioactive material into storage.

The postings in radiation areas to alert personnel to the presence of radiation and radioactive materials in order to aid in minimizing exposures did not always appear effective. Specifically, information concerning radiation dose levels within an large area containing a variety of radiation fields of various magnitudes was not provided at locations. Consequently, personnel would not be able to differentiate a radiation area of 0.1 mrem/hour from one at 30 mrem/hour. The following example is provided:

- The RWMC operated by EG&G stores high level waste (HLW) inside a fenced area (High Radiation Area), which is surrounded by a Radiation Area. A considerable amount of work is conducted in the area including the handling of HLW materials. Shielded transport casks, shielded containers, and extended boom cranes are used to store the HLW in the berm at ground level, and are used to minimize exposures to the worker.

- Radiation signs are posted at the access gates to the HLW area indicating the radiation hazard inside the fence. The radiation levels range from 1.0 mrem/hour in the proximity of the gate to 50.0 rem/hour behind the berm approximately 100 meters from the gate. In a Radiation Area, along the outside of the fence at the open end of the berm, radiation levels are 10-30 mr/hr. However, there are no signs posted on the fence to alert workers to radiation levels at the fence. The Staff noted that High Radiation Areas (e.g., areas where radiation level are greater than 100 mrem/hr) were appropriately posted and controlled.

In summary, the RCM, Article 231 on Posting Requirement states that "radiological posting shall be used to alert personnel to the presence of radiation and radioactive materials and to aid them in minimizing exposures...", and it appear to the Staff that RWMC is not fully satisfying this requirement.

i. Interviews - Nine interviews were conducted with two persons per interview. Those interviewed included two RCT Supervisors, four RCTs, four RW IIs (including two from MK-Ferguson), four RW Is (including two from PTI), and four employees who had received GERT. Two observers were usually present throughout the interviews; one from DOE-ID and one from WINCO. The first WINCO observer was one of the RCT Supervisors whom we later interviewed. It was unfortunate that a more senior WINCO representative was not present for the RCT/RCT Supervisor interviews, and the Staff is not optimistic that a realistic appraisal of the results will be provided WINCO management. The following highlights the interviews:

RCT/RCT Supervisor Interviews

Interviewee comments on training:

- Training is done on overtime.
- Taking core training, not an organized program.
- Provided with core manuals for self-study and then attended core classes.
- Completed three core modules and exams on one shift ... this was tough. There are about 30 modules. Concerned about final exam when all modules are covered and training has been in spurts over an extended period of time.

- Objective of core training and continuing training is to provide and maintain a level of knowledge and consistency. an objective of improving the level of knowledge was not mentioned.

Interviewee responses to radiological control specifics:

- Difficulty relating textbook concepts to in-plant daily activities. (i.e., Curies, DAC, CPM, Conduct of Ops, etc.).
- Dose limit for lifesaving effort in an emergency situation was wrong/overstated.

RW I and II Interviews

Interviewee comments on training:

- One RW II couldn't recall having had any training.

Interviewee response to radiological control specifics:

- One MK-F RW II had an outstanding understanding of radiological control concepts/responsibilities of his duties and of plant application of radiological control requirements.
- Principles and application of ALARA generally well understood. Awareness of time/distance/shielding were apparent.
- Sources of radiation were recognized.
- Were aware of the 1993 annual dose received.

GERT Interviews

Interviewee comments on training:

- Were sent packets of material to read and sign.

Interviewee responses to Radiological control specifics:

- Aware of sources of information to which they are exposed.
- Aware of ALARA and its concepts.

Overall, those interviewed in the RW I, II, and the GERT categories appeared to be better trained to the requirements than did those qualified as RCT/RCT Supervisors. The RW and GERT personal appeared to have a good practical understanding of

radiological principals and controls, while some RCTs did not have an appreciation for applying theory to practice.